

**IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF DELAWARE**

**GIRAFA.COM, INC.,**

Plaintiff,

v.

**AMAZON WEB SERVICES, LLC,  
AMAZON.COM, INC.,  
ALEXA INTERNET, INC.,  
IAC SEARCH & MEDIA, INC.,  
SNAP TECHNOLOGIES INC.,  
YAHOO! INC.,  
SMARTDEVIL INC.,  
EXALEAD INC., AND  
EXALEAD SA.,**

Defendants.

C.A. No. 07-787-SLR

**REDACTED  
PUBLIC VERSION**

**DECLARATION OF SHIRLI RAN  
IN SUPPORT OF PLAINTIFF GIRAFA.COM, INC.'S  
MOTION FOR PRELIMINARY INJUNCTION**

I, Shirli Ran, hereby declare as follows:

1. I am the Chief Operating Officer ("COO") for Girafa.com, Inc. ("Girafa") and have held this position since 1999. As COO of Girafa, I oversee the company's product development, operational and business activities.
2. I have personal knowledge of the following facts and, if called as a witness, could and would competently testify thereto.
3. Girafa was formed in 1999 and, since this time, it sought to be and has been an industry leader in revolutionizing the experience of information search and Web navigation on the Internet via its thumbnail services that allow internet users to preview a hyperlinked URL without leaving the page they are viewing and without accessing or loading the hyperlinked page.

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These previews are thumbnail-sized visual images of the hyperlinked website/s. The previews can be displayed automatically by the website and/or the controlling software, or can be displayed based in part on the user's cursor or mouse movement. (An example of a "hyperlinked URL" is a search result listing displayed by a search engine website after a user conducts a search).

4. Girafa's business plan is largely based on the technology described in Girafa's U.S. Patent No. 6,864,904 ("904 patent"), which is attached as Exhibit 1.

5. The '904 patent, which is titled "Framework for providing visual context to www hyperlinks," was filed on November 8, 2000 and issued on March 8, 2005. The '904 patent is based on provisional application No. 60/169,328 filed by Girafa on December 6, 1999. This patent is assigned to Girafa and names Shirli Ran, Eldad Barnoon and Yuval Yarom as the inventors.

6. Girafa's visualization technology makes sorting through search result listings and hyperlinks in general, easier and more efficient, by enabling users to view thumbnail sized images of the web sites listed on textual search result pages and other WWW hyperlinks, thereby providing web users with additional information about such hyperlinks, without the time consuming task of loading each web page.

7. More specifically, Girafa's technology offers web users the ability to see what a web page looks like, without having to leave the originating site and without accessing the site and waiting for the requested web page to load. Girafa's thumbnail previews offer users additional information about the hyperlinked site, allowing a user to quickly view branding, and

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look & feel information for that site, which offers the user additional relevancy criteria, and helps evaluate the site, and identify relevant and familiar sites faster.

8. This visual representation of textual hyperlinks, as described in Girafa's '904 patent, brings simplicity, productivity and efficiency to the WWW search and browsing experience.

9. Since 2000/2001, Girafa's business model for generating its revenue has been to create thumbnail images ("thumbnails") of web pages, and charge its customers for accessing these thumbnails stored on Girafa's image servers, and for serving these thumbnails for display on customers' sites. For example, customers seeking to display thumbnails of search results listing on their own websites pay Girafa based on the number of thumbnails they want Girafa to create, and the number of thumbnails they need Girafa to serve their users from Girafa's image servers.

10. Girafa stores thumbnails of over 30 million different websites in a farm of image servers. These image servers are separate from the servers that host Girafa's website [www.Girafa.com](http://www.Girafa.com). The image servers are also separate from Girafa's customer's website servers. The use of separate image servers has enabled Girafa to spawn this industry of selling thumbnail images to third party websites. The use of servers that are separate from the customer's web site also allows Girafa and the customer to reduce the costs associated with creating a server of thumbnails, as customers share the cost of creating/capturing the thumbnails with other Girafa customers, and can therefore pay lower service fees.

11. Girafa's technology, which stores the thumbnail images on separate image servers, allows Girafa to sell access to those image servers, to third party websites all over the world.

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Because the thumbnail images are stored on Girafa's image servers which are easily scalable, Girafa can ensure that peak load periods of thumbnail requests will not impact the responsiveness of its customer's websites, or of [www.girafa.com](http://www.girafa.com). By providing thumbnail images from Girafa's image servers, new thumbnail images can be added, and existing thumbnails updated, without interruptions to the customer's site or services.

12. Some earlier thumbnail technologies would generate thumbnail images of websites only in real time when a user requested a thumbnail image preview. Other systems might store all of the thumbnails on the server(s) that hosted part or all of a website search engine. These approaches could not support the industry that Girafa has created, or offer the enhanced user experience that Girafa's thumbnail service was designed to provide. First, real-time generation of thumbnails requires users to wait for the thumbnail/s to be created, thereby failing to offer the value the thumbnails aim at providing, which is immediate preview of hyperlinks. Generating the thumbnails after the user requests a preview is too slow for today's Internet users, and fails to offer an efficient, fast solution, resulting in a poor user experience.

13. Similarly, had Girafa not maintained its image servers to operate separately from its customers' website servers, an interdependency between the customers' website servers and the image servers would exist. Such an interdependency would require customer/s to invest time and effort in integrating the system, and in its continuous monitoring and testing following any change to the web site or image server. Such an interdependency may also, in some circumstances, cause interruptions to the web site, and could even slow it down. From Girafa's standpoint, such an interdependency would make it extremely cumbersome to maintain a reasonable quality of service.

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### **Success of Girafa's Thumbnail Technology**

14. As noted above, Girafa's main revenue source is to charge its customers for using thumbnails stored and served from its servers.

15. Girafa instituted this business model in 2000, and it was initially successful because of the technology described in the '904 patent.

16. Since launching in 2000, Girafa's thumbnail technology has been frequently recognized as a significant innovation. Attached as Exhibits 2-4, are some of the news articles discussing Girafa's thumbnail technology, including articles and ratings from PC Magazine (Ex. 2), CNET (Ex. 3), and ZDNet. (Ex. 4). In 2003, CNET rated Girafa's thumbnail toolbar technology one of the fifty best downloads of the year.

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### **Harm from Competitors**

18. Girafa's business model has served Girafa well until recently when the defendants that are the subject of this preliminary injunction motion began providing the same type of thumbnail image access.

19. Snap uses its website www.snap.com to advertise, demonstrate, sell, and give away for free, access to thumbnail images of websites as well as code to display those thumbnails on the customer's website.

20. Smartdevil uses its websites www.thumbshots.com, www.thumbshots.org, and www.thumbshots.net to advertise, demonstrate, sell, and give away for free, access to thumbnail images of websites as well as code to display those thumbnails on the customer's website.

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21. The Amazon defendants (Amazon.com, Alexa.com, and Amazon Web Services or "AWS") sell access to thumbnails of websites to other website owners, as well as code so that the customer can display the thumbnails on the customer's website.

22. After Girafa began selling its thumbnail services, competitors such as Snap.com, Amazon/Alexa/AWS, and Smartdevil began to both sell and give away thumbnail access to third parties based on the same technology as in the '904 patent.

23. In April 2004, Snap's incubator company, Idealab, contacted Girafa and requested information about Girafa's thumbnail services and pricing. I spoke with and exchanged emails with Aaron Boyer from a Research and Development department of Idealab and later sent him quotes for Girafa's services. See, Exhibit 5, which is a chain of emails between me and Mr. Boyer. I also informed him that Girafa had a pending patent that covered this technology.

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Attached as Exhibit 6 is an email received from Compete.com in which they decline to use thumbnail services from Girafa because they have a relationship with Snap.

25. Because Snap, Smartdevil, and Amazon/Alexa/AWS are using Girafa's patented technology, Girafa has lost and will continue to lose significant market share that cannot be replaced unless these defendants stop infringing the '904 patent. The loss of market share and customers is expected to continue and to increase, in part due to offerings from at least Snap and Smartdevil of Girafa's patented technology for free, ie., without charging any service fees for its usage.

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27. Girafa's thumbnail services are provided and offered to customers as a fully hosted service, where Girafa hosts, runs, maintains, monitors and supports the servers, networks, applications and thumbnails used to provide the thumbnail service to customers and end users. All a customer needs to do to use Girafa's thumbnails is add Girafa's code to its web pages. Customers can have the service up and running on their site in minutes. This is the level of service that is required in the industry Girafa operates in.

28. Running a fully hosted service means that there are ongoing costs of operating the service such as bandwidth costs (needed to create the thumbnails and serve them), hardware, space, power etc.

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I declare under the penalty of perjury that the above is true and accurate to the best of my knowledge.

Dated: March 7, 2008

By: Shirli Ran  
Shirli Ran

# **EXHIBIT 1**





US006864904B1

(12) **United States Patent**  
**Ran et al.**

(10) **Patent No.:** **US 6,864,904 B1**  
 (45) **Date of Patent:** **Mar. 8, 2005**

(54) **FRAMEWORK FOR PROVIDING VISUAL  
 CONTEXT TO WWW HYPERLINKS**

(75) Inventors: **Shirli Ran, Savion (IL); Eldad  
 Barnoon, Tel Aviv (IL); Yuval Yarom,  
 Ra'anana (IL)**

(73) Assignee: **Girafa.com Inc., Wilmington, DE (US)**

(\*) Notice: Subject to any disclaimer, the term of this  
 patent is extended or adjusted under 35  
 U.S.C. 154(b) by 224 days.

(21) Appl. No.: **09/708,191**

(22) Filed: **Nov. 8, 2000**

#### Related U.S. Application Data

(60) Provisional application No. 60/169,328, filed on Dec. 6,  
 1999.

(51) Int. Cl.<sup>7</sup> ..... **G09G 5/00**

(52) U.S. Cl. .... **345/760; 345/744; 345/763;  
 345/838**

(58) Field of Search ..... **345/744, 760,  
 345/763, 838; 715/501.1, 526, 513**

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 6,181,342 B1 \* 1/2001 Niblack ..... 345/635  
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 6,665,838 B1 \* 12/2003 Brown et al. .... 715/501.1

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Andy Cockburn, et al, "Issues of page representation and organization in web browser's revisitation tools", proceedings of the OZCHI'99 Australian Conf. of Human Computer Interaction, Nov. 28-30, Wagga Wagga Australia.

Benjamin B. Bederson, et al, "A zooming web browser", published in 1996 in the 9<sup>th</sup> Annual ACM Symposium on user-interface software and technology.

George Robertson, et al, "Data mountain: using spatial memory for document management", published in 1998 in the 9<sup>th</sup> Annual ACM Symposium on user-interface software and technology.

Mary Czerwinski, et al, "Visualizing implicit queries for information management and retrieval", published in May 1999, in the proceedings of the ACM Conference on human factors in computing systems.

\* cited by examiner

*Primary Examiner*—Matthew C. Bella

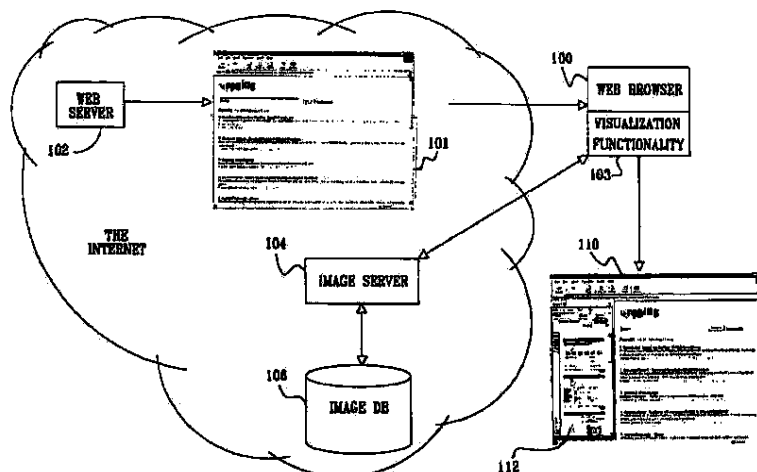
*Assistant Examiner*—Po Wei Chen

(74) *Attorney, Agent, or Firm*—Ladas & Parry

#### (57) ABSTRACT

A method and a system for presenting Internet information to a user including providing to a user a visual image of a web page containing at least one hyperlink, and at least partially concurrently providing a visual image of another web page of at least one web site which is represented by the at least one hyperlink.

**56 Claims, 11 Drawing Sheets**



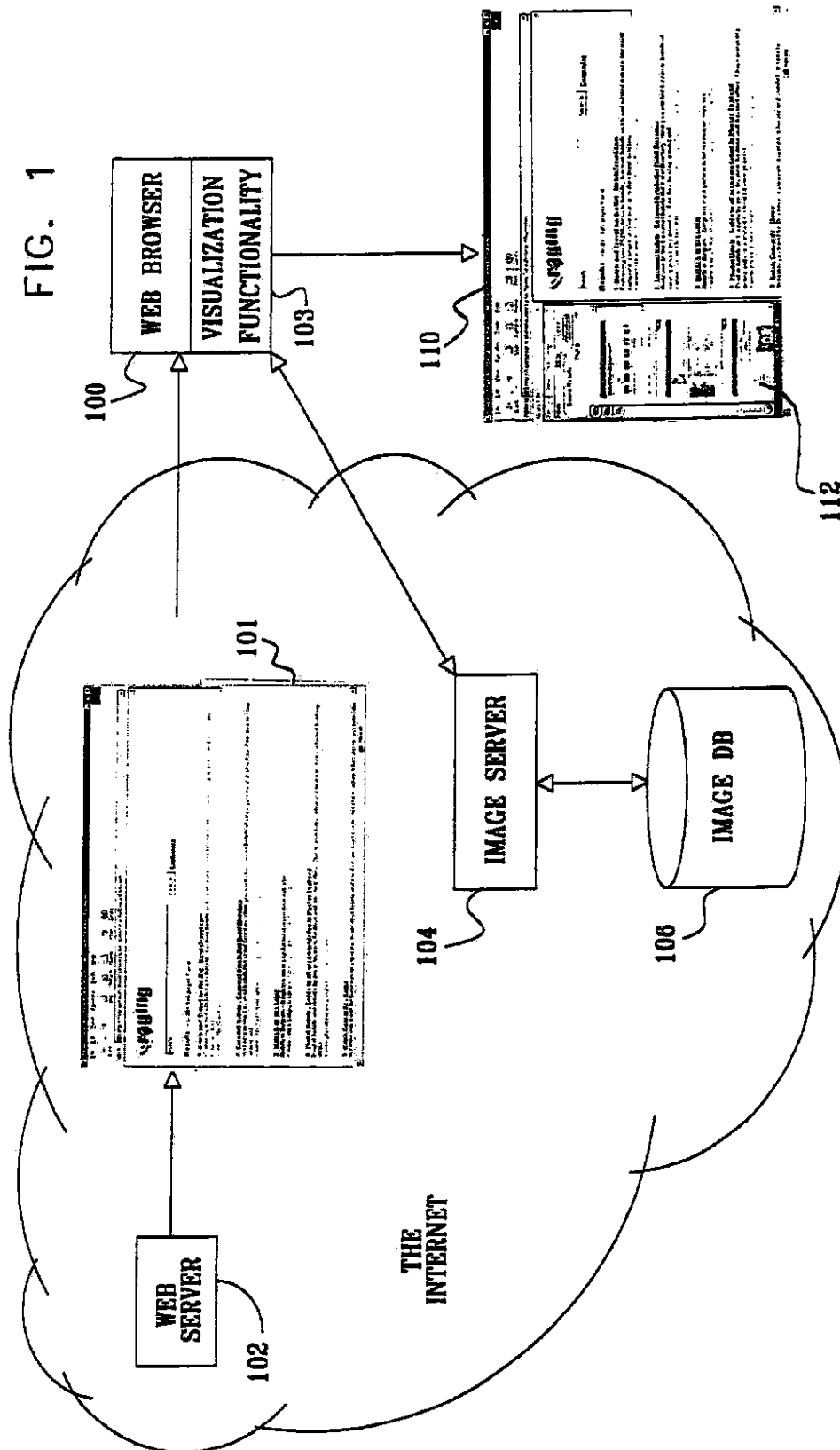
U.S. Patent

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FIG. 1



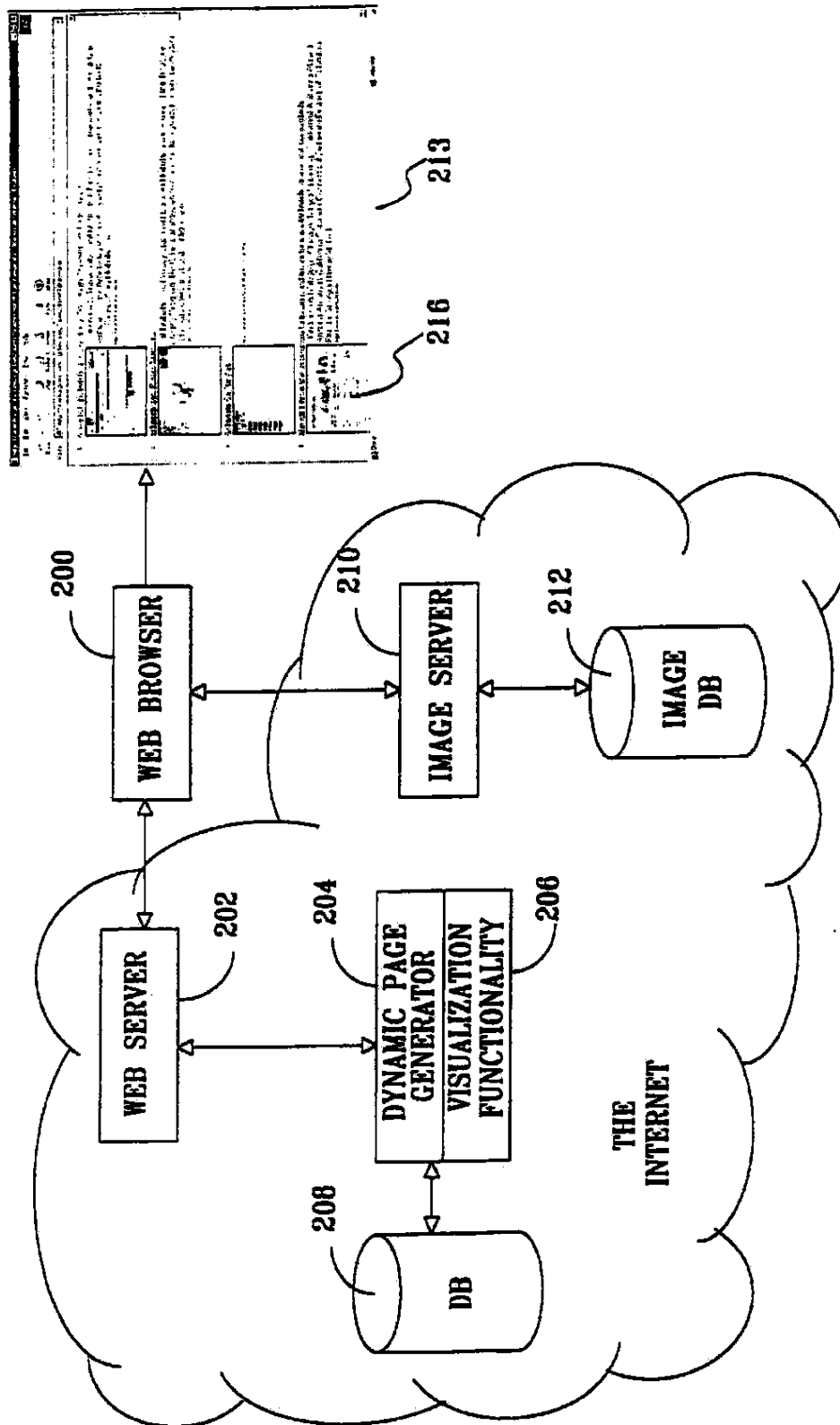
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FIG. 2



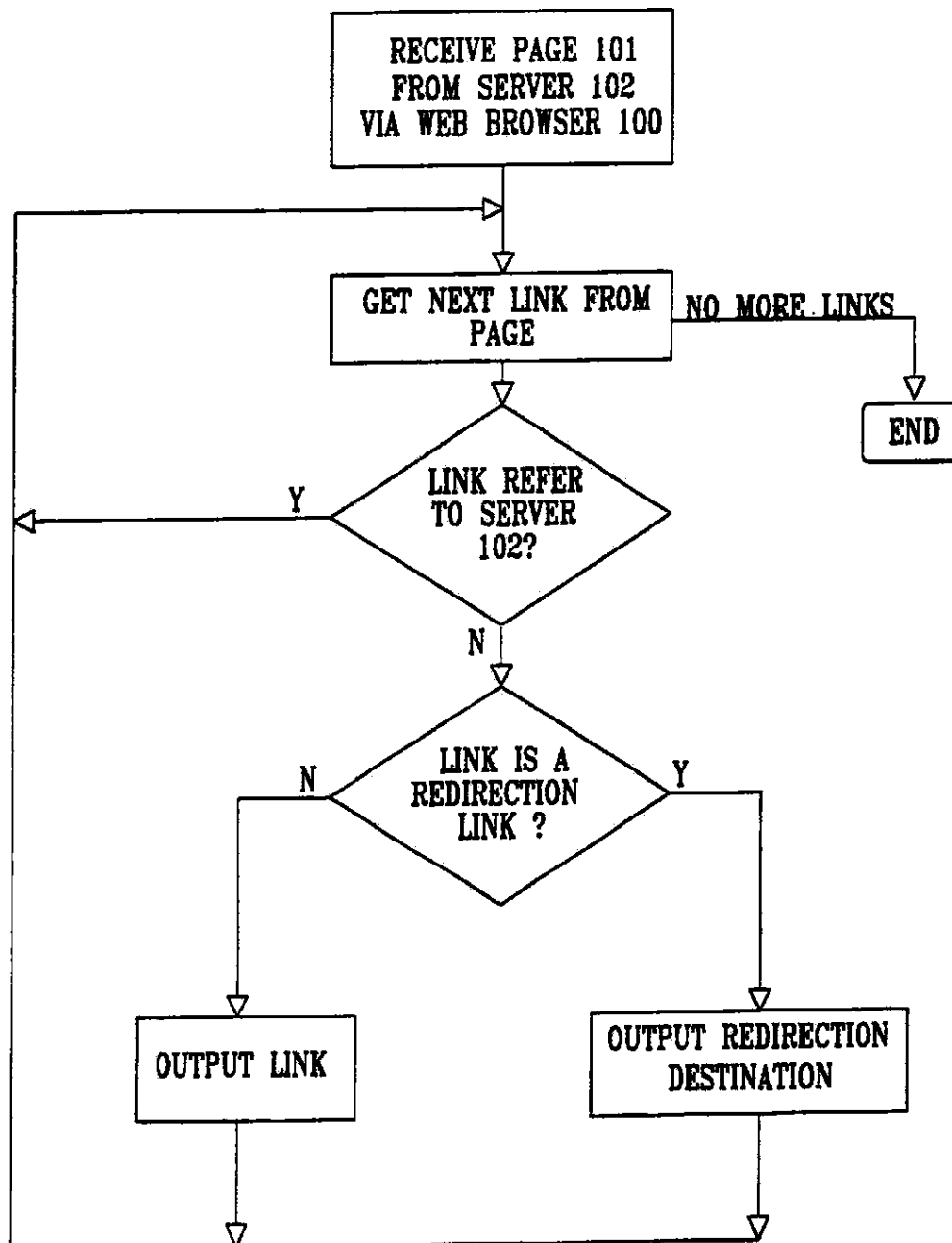
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FIG. 3



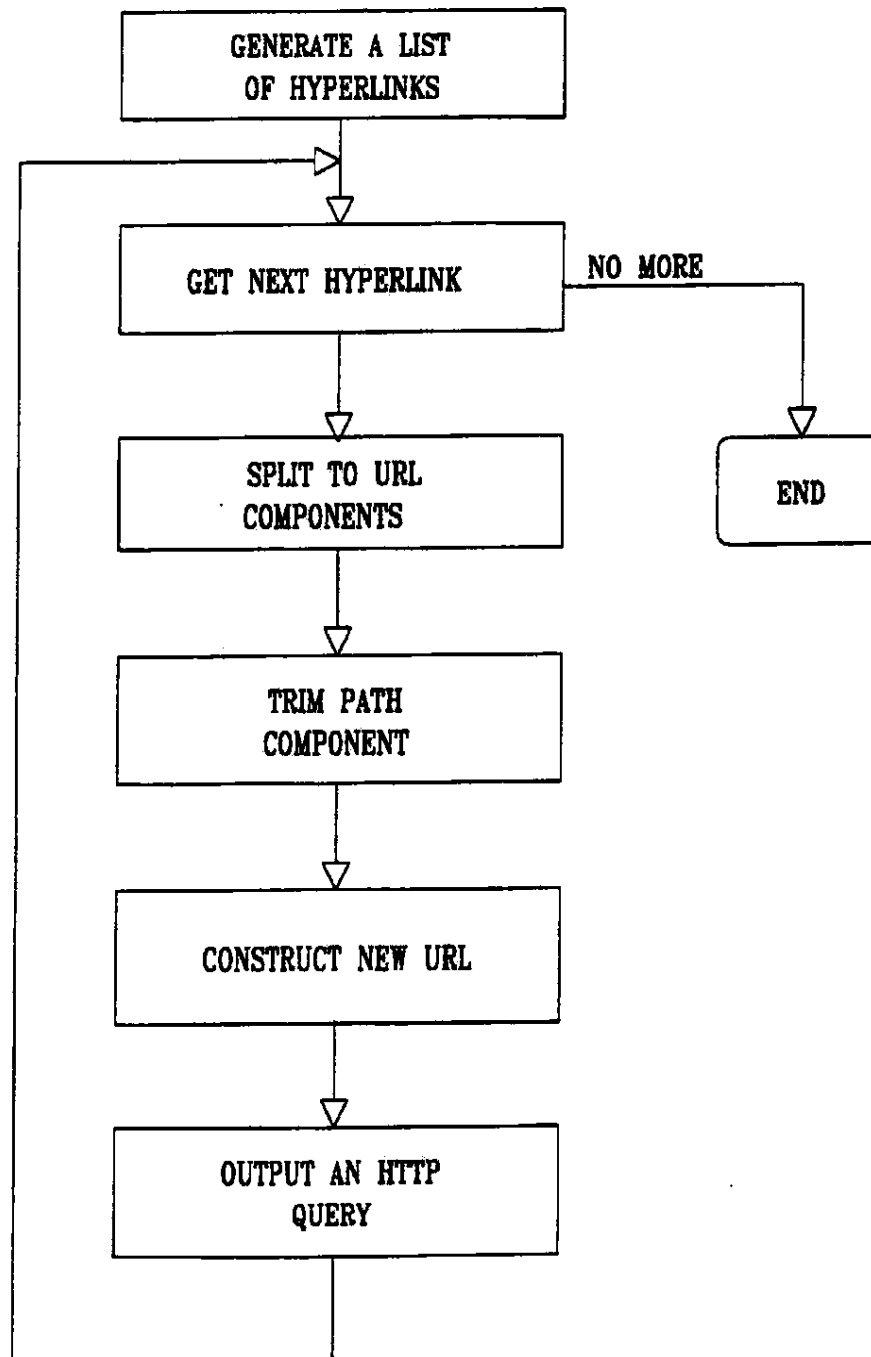
**U.S. Patent**

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**FIG. 4**



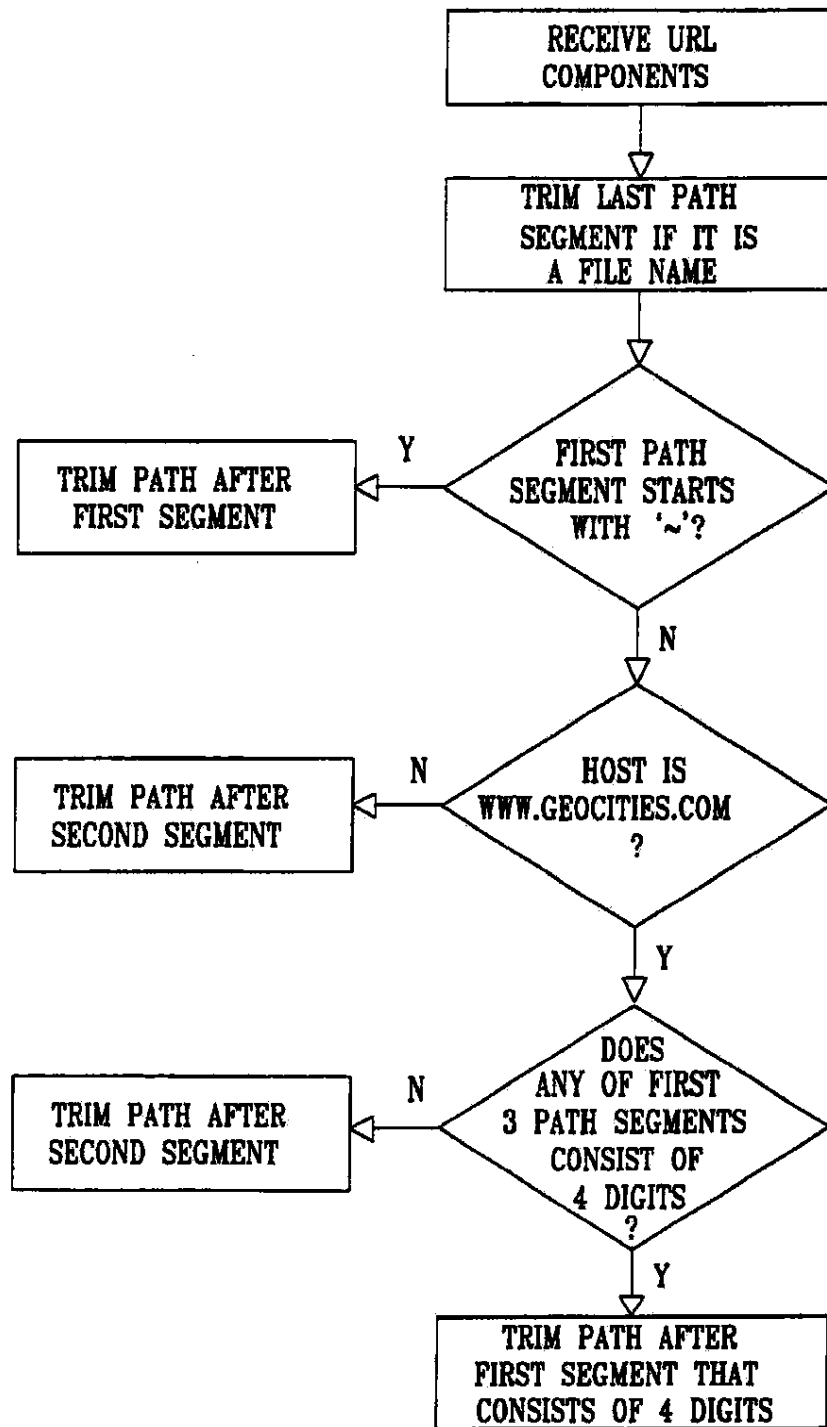
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FIG. 5



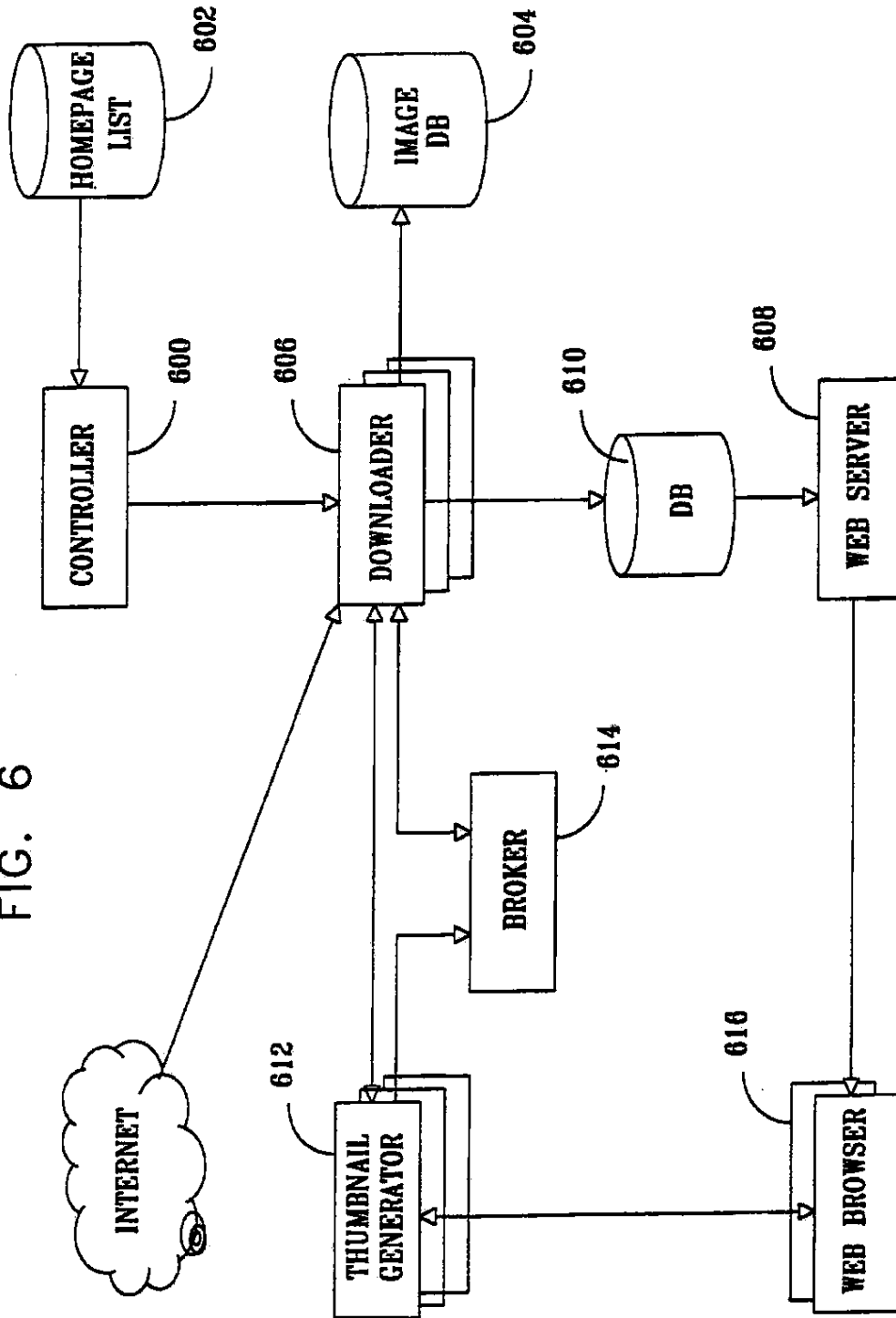
U.S. Patent

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FIG. 6



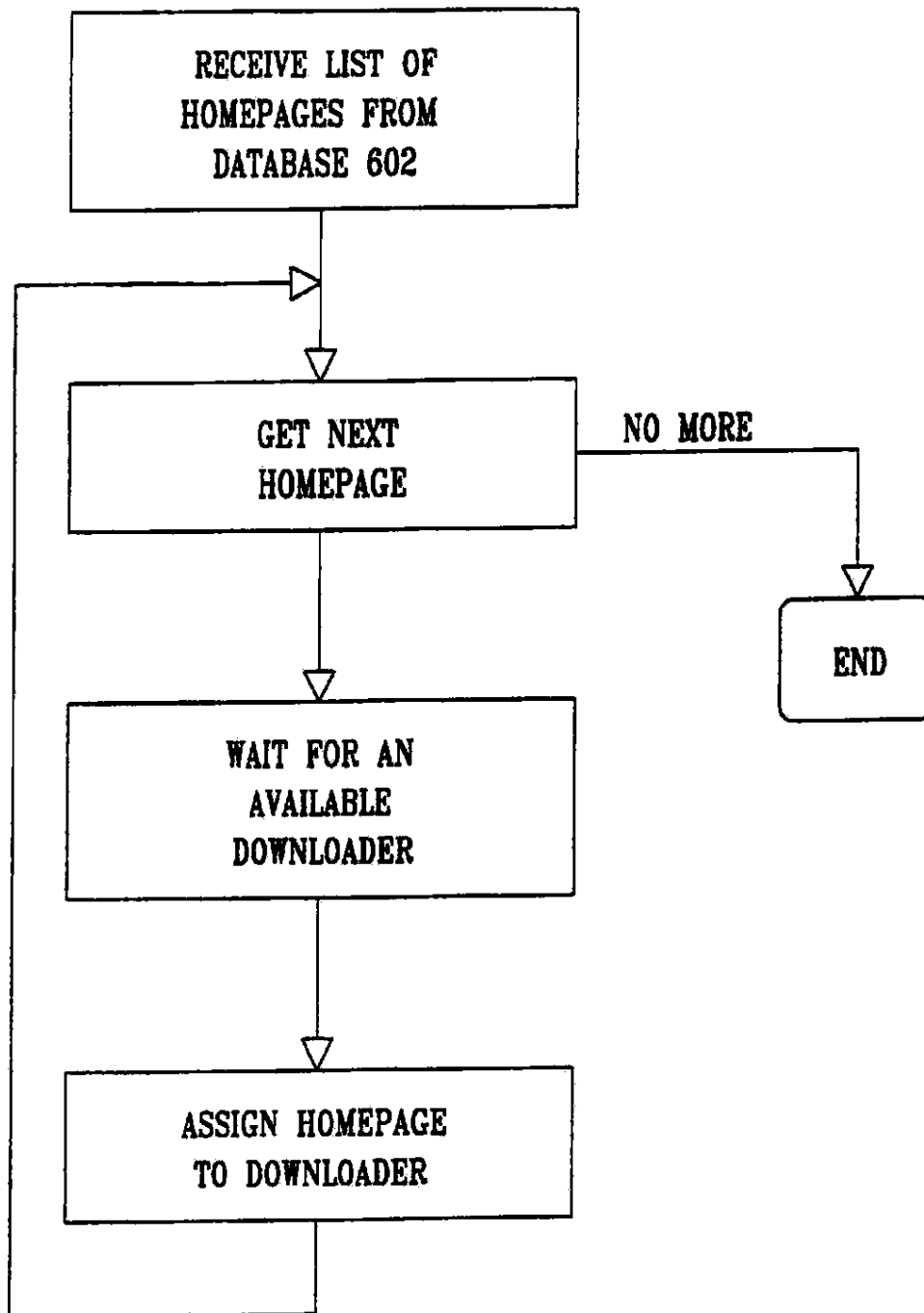
**U.S. Patent**

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**FIG. 7**





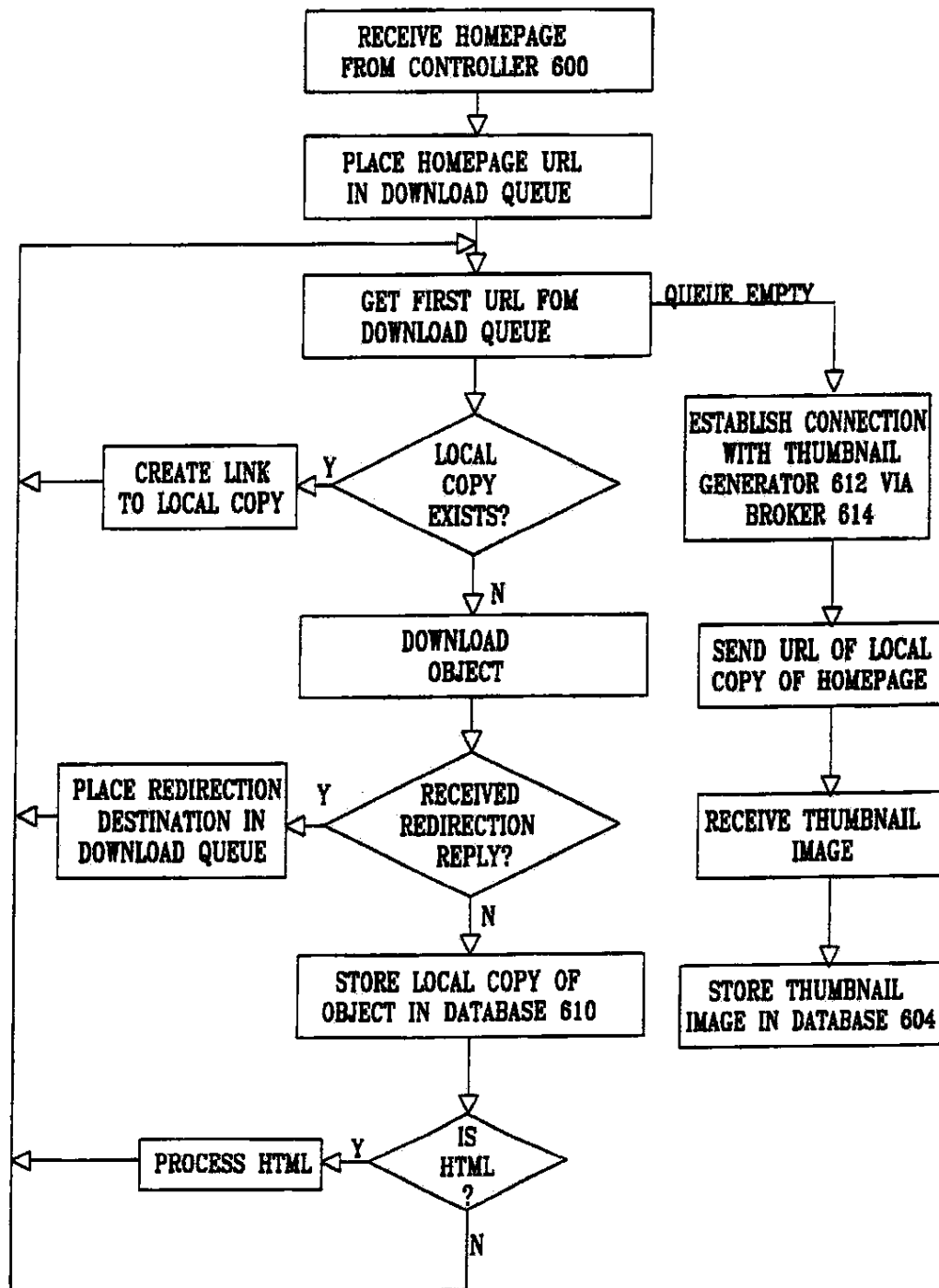
U.S. Patent

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FIG. 8



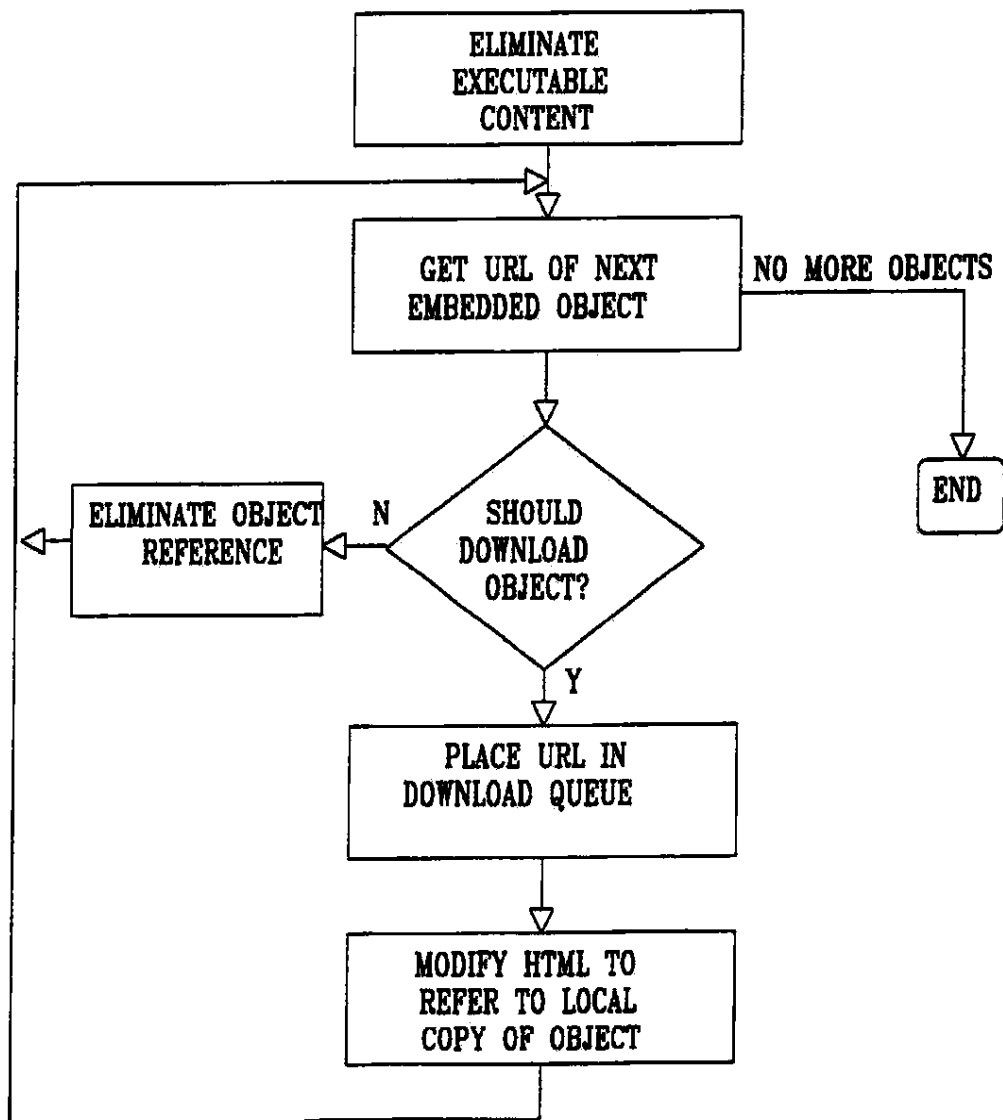
**U.S. Patent**

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**FIG. 9**

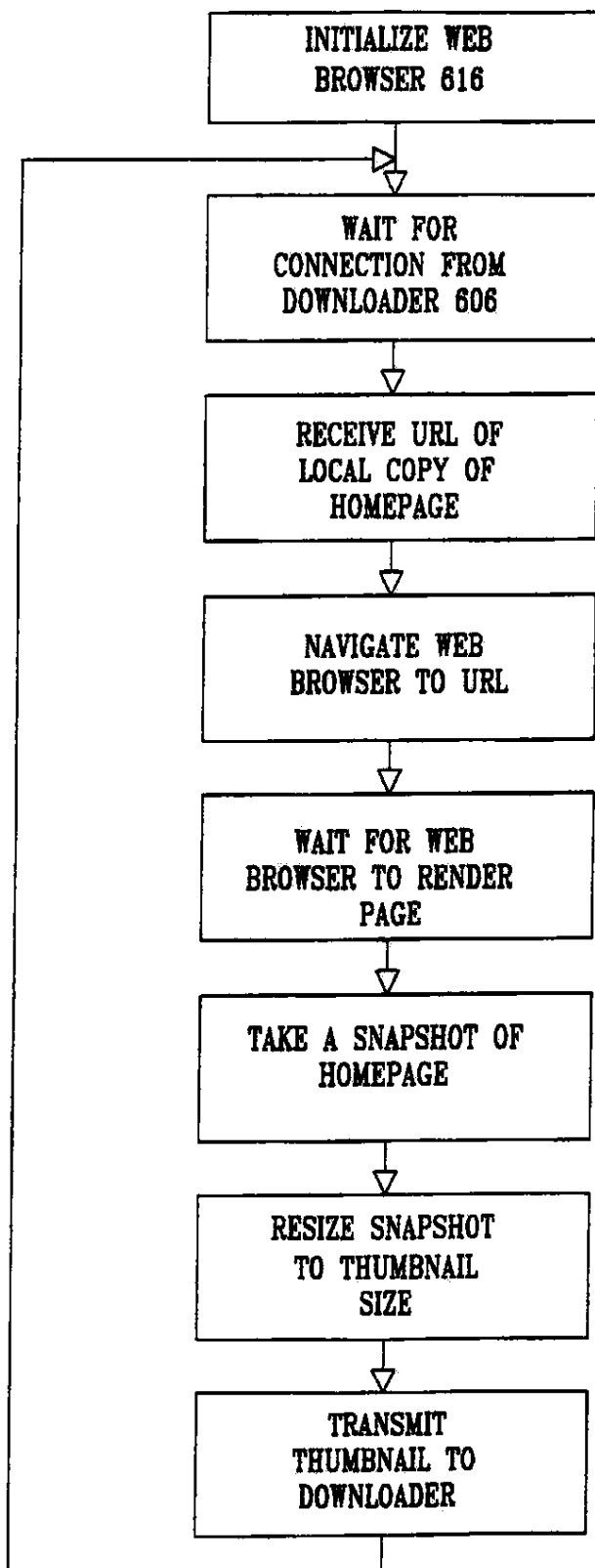


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**FIG. 10**

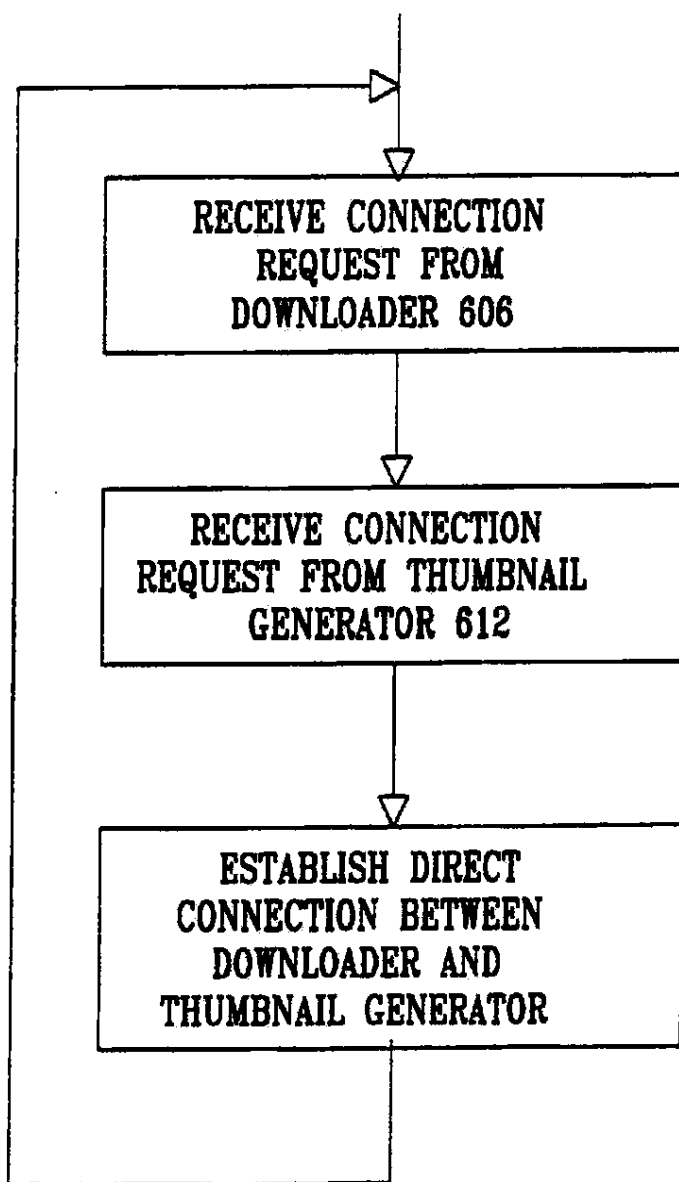
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**FIG. 11**



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## FRAMEWORK FOR PROVIDING VISUAL CONTEXT TO WWW HYPERLINKS

### PRIORITY CLAIM

This application claims priority from Provisional Appli- 5  
cation Ser. No. 60/169,328, filed Dec. 6, 1999.

The material on the compact discs labeled COPY 1 and  
COPY 2 is incorporated by reference. The compact discs are  
identified in the LIST OF APPENDICES below.

### FIELD OF THE INVENTION

The present invention relates to Internet methodologies  
and systems generally and more particularly to systems and  
methodologies for displaying information received over the  
Internet.

### BACKGROUND OF THE INVENTION

The following U.S. patents are believed to represent the  
current state of the art: U.S. Pat. Nos. 6,101,510; 6,016,494;  
6,011,537; 5,973,692.

The following disclosures are also believed to be relevant  
to the subject matter of the present invention:

R. J. Yarger, G. Reese, and T. King "MySQL & mSQL,"  
O'REILLY & Associates Inc, 1999, ISBN 1-56592-  
434-7;

B. Laurie, and P. Laurie "Apache the Definitive Guide,  
2nd edition," O'REILLY & Associates Inc, 1999, ISBN  
1-56592-528-9;

C. Musciano, and B. Kennedy "HTML the Definitive 30  
Guide, 3rd edition," O'REILLY & Associates Inc,  
1998, ISBN 1-56592-492-4;

Libwww <http://www.w3.org/Library>;

T. Berners-Lee, R. Fielding, and L. Masinter "Uniform  
Resource Identifiers (URI): Generic Syntax", RFC  
2396, August 1998.

### SUMMARY OF THE INVENTION

The present invention seeks to provide a particularly  
beneficial methodology and system for displaying informa- 40  
tion received over the Internet.

There is thus provided in accordance with a preferred  
embodiment of the present invention a method for present-  
ing Internet information to a user. The method includes  
providing to a user a visual image of a web page containing  
at least one hyperlink, and at least partially concurrently  
providing a visual image of another web page of at least one  
web site which is represented by said at least one hyperlink.

Further in accordance with a preferred embodiment of the  
present invention the visual image of said another web page  
is displayed alongside the visual image of said web page.

Preferably the visual image of another web page appears  
hovering over said hyperlink.

Still further in accordance with a preferred embodiment of 55  
the present invention the visual image of said another web  
page is displayed within the visual image of said web page.  
The visual image of another web page appears hovering over  
said hyperlink.

Additionally in accordance with a preferred embodiment 60  
of the present invention the visual images of a plurality of  
other web pages represented by at least one hyperlink are  
displayed simultaneously along with said visual image of a  
web page containing at least one hyperlink.

Furthermore in accordance with a preferred embodiment 65  
of the present invention the web page comprises an HTML  
page.

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Moreover in accordance with a preferred embodiment of  
the present invention, the method also includes providing a  
visual image of another web page includes employing a web  
browser including visualization functionality which inter-  
faces via the Internet with an image server.

Preferably the visualization functionality is operative to  
download via the image server from an image database  
images of web pages which are referenced in hyperlinks  
contained in the web page and to provide to a user, via the  
web browser, an annotated web page. 10

Additionally or alternatively the annotated web page  
includes the web page having alongside it images of home-  
pages linked with the web page.

Further in accordance with a preferred embodiment of the  
present invention, the method includes providing a visual  
image of another web page and includes employing a web  
browser which interfaces via the Internet with a web server  
including visualization functionality. 15

Preferably the visualization functionality operates to  
embed commands to the web browser to download, via an  
image server, images of web pages which are referenced in  
hyperlinks contained in the web page and to provide to a  
user, via the web browser, an annotated web page. 20

Additionally the annotated web page may include the web  
page having within it images of homepages linked with the  
web page.

Additionally in accordance with a preferred embodiment  
of the present invention the visualization functionality  
includes generation of a list of hyperlinks from a web page,  
elimination of links which refer back to a web server sending  
said web page, determination of whether redirection links  
are present and if so, visualizing an ultimate destination  
thereof and visualizing remaining hyperlinks.

Further in accordance with a preferred embodiment of the  
present invention the visualization functionality may also  
include receiving a list of hyperlinks, splitting a URL of each  
hyperlink into URL components including at least a path  
component and a host component, trimming a path compo-  
nent based on the consideration of finding the most repre-  
sentative image of a given web page and constructing a new  
URL including a trimmed path component. 40

There is also thus provided in accordance with a preferred  
embodiment of the present invention a method for generat-  
ing a web page image database. The method includes  
receiving a list of URLs corresponding to web pages, the  
images of which it is desired to download into an image  
database, operating a multiplicity of downloaders simulta-  
neously by supplying to each downloader one URL at a time,  
causing each downloader to retrieve from the Internet, a web  
page and embedded objects corresponding to the URL  
supplied to it, causing a thumbnail generator to render the  
web page and causing said thumbnail generator to shrink  
said rendered image of the web page and supply it to the  
downloader. 50

Further in accordance with a preferred embodiment of the  
present invention the method also includes deleting execut-  
able content from the web page.

Still further in accordance with a preferred embodiment of  
the present invention the method includes causing each  
downloader to retrieve from the Internet, a web page and  
embedded objects corresponding to the URL supplied to it  
and causing a thumbnail generator to operate a correspond-  
ing web browser to render the web page employ a locally  
stored copy of said web page and said embedded objects.

Additionally in accordance with a preferred embodiment  
of the present invention the method includes employing a

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web server for providing said locally stored copy of said web page and of said embedded objects to said web browser.

Furthermore in accordance with a preferred embodiment of the present invention the visual image of another web page appears hovering over said hyperlink.

There is further provided in accordance with another preferred embodiment of the present invention a system for presenting Internet information to a user including a first functionality providing to a user a visual image of a web page containing at least one hyperlink and a second functionality operative at least partially concurrently with said first functionality for providing a visual image of another web page of at least one web site which is represented by said at least one hyperlink.

Further in accordance with a preferred embodiment of the present invention the visual image of said another web page is displayed alongside the visual image of said web page.

Still further in accordance with a preferred embodiment of the present invention the visual images of said another web page is displayed within the visual image of said web page.

Furthermore in accordance with a preferred embodiment of the present invention the visual images of a plurality of other web pages represented by at least one hyperlink are displayed simultaneously along with said visual image of a web page containing at least one hyperlink.

Additionally in accordance with a preferred embodiment of the present invention the web page comprises an HTML page.

Further in accordance with a preferred embodiment of the present invention the second functionality comprises third functionality employing a web browser including visualization functionality which interfaces via the Internet with an image server.

Preferably the visualization functionality is operative to download via the image server from an image database images of web pages which are referenced in hyperlinks contained in the web page and to provide to a user, via the web browser, an annotated web page. Additionally or alternatively the annotated web page includes the web page having alongside it images of homepages linked with the web page.

Further in accordance with a preferred embodiment of the present invention the second functionality comprises fourth functionality employing a web browser which interfaces via the Internet with a web server including visualization functionality.

Preferably the visualization functionality is operative to embed commands to the web browser to download, via an image server, images of web pages which are referenced in hyperlinks contained in the web page and to provide to a user, via the web browser, an annotated web page. Additionally or alternatively the annotated web page includes the web page having within it images of homepages linked with the web page.

Further in accordance with a preferred embodiment of the present invention the visualization functionality includes the generation of a list of hyperlinks from a web page, the elimination of links which refer back to a web server sending said web page, the determination of whether redirection links are present and if so, visualizing an ultimate destination thereof and the visualizing remaining hyperlinks.

Still further in accordance with a preferred embodiment of the present invention the visualization functionality includes receiving a list of hyperlinks, splitting a URL of each hyperlink into URL components including at least a path

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component and a host component, trimming a path component based on the consideration of finding the most representative image of a given web page and constructing a new URL including a trimmed path component.

Furthermore in accordance with a preferred embodiment of the present invention the visual image of another web page appears hovering over said hyperlink.

Additionally in accordance with a preferred embodiment of the present invention the visual image of another web page appears hovering over said hyperlink.

Additionally or alternatively the visual image of another web page appears hovering over said hyperlink. Preferably the visual image of another web page appears hovering over said hyperlink.

Furthermore the visual image of another web page may appear to hover over said hyperlink.

Still further in accordance with a preferred embodiment of the present invention the visual image of another web page appears hovering over said hyperlink.

There is provided in accordance with yet another preferred embodiment of the present invention a system for generating a web page image database, the system includes at least one downloader receiving one URL at a time and retrieving from the Internet a web page and embedded objects corresponding to the URL received by it and at least one thumbnail generator operative to render the web page, shrink said rendered image of the web page and supply said rendered image to the downloader.

Further in accordance with a preferred embodiment of the present invention the at least one downloader is operative to delete executable content from the web page.

Still further in accordance with a preferred embodiment of the present invention each downloader retrieves from the Internet, a web page and embedded objects corresponding to the URL received by it and locally stores a copy of said web page and said embedded objects and causes said thumbnail generator to render the web page by employing said locally stored copy of said web page and said embedded objects.

Preferably the system also includes a web server providing said locally stored copy of said web page and of said embedded objects.

#### BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be understood and appreciated more fully from the following detailed description, taken in conjunction with the drawings in which:

FIG. 1 is a simplified partially pictorial, partially block diagram illustration of a system and methodology for displaying information received over the Internet in accordance with a preferred embodiment of the present invention;

FIG. 2 is a simplified partially pictorial, partially block diagram illustration of a system and methodology for displaying information received over the Internet in accordance with another preferred embodiment of the present invention;

FIG. 3 is a simplified flow chart of part of visualization functionality employed in the system and methodology of FIG. 1;

FIG. 4 is a simplified flow chart of visualization functionality employed in accordance with a preferred embodiment of the present invention;

FIG. 5 is a simplified flow chart of path component trimming functionality employed in the embodiment of FIG. 3;

FIG. 6 is a simplified block diagram illustration of a system for generating an image database useful in the system and methodology of FIGS. 1 and 2;

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FIG. 7 is a flow chart illustrating operation of a controller forming part of the system of FIG. 6;

FIG. 8 is a flow chart illustrating operation of a downloader forming part of the system of FIG. 6;

FIG. 9 is a flow chart illustrating operation of a process HTML algorithm employed in the downloader of FIG. 8;

FIG. 10 is a flow chart illustrating operation of a thumbnail generator forming part of the system of FIG. 6; and

FIG. 11 is a flow chart illustrating operation of a broker forming part of the system of FIG. 6.

#### LIST OF APPENDICES

Appendix A is a software listing in hexadecimal form of software suitable for providing the visualization functionality of FIG. 1 when installed in accordance with installation instructions set forth hereinbelow;

Appendix B is a software listing in hexadecimal form of software suitable for providing the functionality of FIG. 6 when installed in accordance with installation instructions set forth hereinbelow;

Appendix C is a software listing in hexadecimal form of software suitable for providing the functionality of an image server of FIG. 1 and FIG. 2 when installed in accordance with installation instructions set forth hereinbelow.

The foregoing software listing are protected by copyright in the USA and in all other jurisdictions.

Appendix A, Appendix B and Appendix C are included on Copy 1 and Copy 2 of the CD-Rs attached herewith to the present application. Each CD-R includes the files GIRAF.A.hex (Appendix A) of Nov. 7, 2000 and of length 3,052,711 bytes; ARANHA.hex (Appendix B) of Nov. 7, 2000 and of length 5,498,984 bytes and IMAGE.hex (Appendix C) of Nov. 7, 2000 and of length 217,154 bytes.

#### DESCRIPTION OF PREFERRED EMBODIMENTS

Reference is now made to FIG. 1, which is a simplified partially pictorial, partially block diagram illustration of a system and methodology for displaying information received over the Internet in accordance with a preferred embodiment of the present invention. As seen in FIG. 1, a web browser 100, such as Microsoft Internet Explorer 5.5, typically resident on a PC, such as a Dell Dimension L733 running Microsoft Windows 98, receives a web page 101, such as an HTML page, over the Internet from a web server 102. The web browser 100 preferably includes visualization functionality 103 which interfaces, typically via the Internet, with an image server 104, such as a Dell Power Edge 2450 running Apache 1.3.12 on an OpenBSD 2.7 operating system.

The image server 104 interfaces with an image database 106, which is preferably a Dell Power Edge 2450 running MySQL 3.23.25 on an OpenBSD 2.7 operating system which is preferably loaded by using functionality of the type described hereinbelow with reference to FIG. 7.

The visualization functionality 103 is operative to download via the image server 104 from the image database 106 images of web pages which are referenced in hyperlinks contained in the web page 101 and to provide to a user, via the web browser 100, an annotated web page 110, which preferably includes the web page 101 having alongside it images 112 of homepages linked with web page 101.

Reference is now made to FIG. 2, which is a simplified partially pictorial, partially block diagram illustration of a

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system and methodology for displaying information received over the Internet in accordance with another preferred embodiment of the present invention. As seen in FIG. 2, a web browser 200, typically resident on a PC, such as a Dell Dimension L733 running Microsoft Windows 98, interfaces, typically via the Internet, with a web server 202, such as a Dell Power Edge 2450 running Apache 1.3.12 on an OpenBSD 2.7 operating system.

The web server 202 interfaces with a dynamic page generator 204, such as a P.H.P. 4.0.2, in which is preferably installed a visualization functionality 206, which is described hereinbelow in greater detail. The dynamic page generator 204 interfaces with a database 208, such as a Dell Power Edge 2450 running MySQL 3.23.25 on an OpenBSD 2.7 operating system.

The web browser 200 preferably interfaces with an image server 210, such as a Dell Power Edge 2450 running Apache 1.3.12 on an OpenBSD 2.7 operating system. The image server 210 interfaces with an image database 212, which is preferably a Dell Power Edge 2450 running MySQL 3.23.25 on an OpenBSD 2.7 operating system, which is preferably loaded by using functionality of the type described hereinbelow with reference to FIG. 7.

The visualization functionality 206 is operative to embed within a dynamically generated web page, such as an HTML page, commands to the web browser 200 to download via the image server 210 from the image database 212 images of web pages which are referenced in hyperlinks contained in a web page 213 and to provide to a user, via the web browser 200, the web page 213 annotated to include therewithin images 216 of homepages linked therewith.

It is appreciated that either or both of the embodiments of FIGS. 1 and 2 may provide images of web pages which are referenced in hyperlinks contained in a web page either alongside or within that web page. It is also appreciated that either or both of the embodiments FIGS. 1 and 2 may provide images of web pages which are referenced in hyperlinks contained in a web page, which images hover either over or alongside the hyperlinks. It is appreciated that the visual image of another web page may function as a hyperlink.

Reference is now made to FIG. 3, which is a simplified flow chart of part of visualization functionality employed in the system and methodology of FIG. 1. The flow chart of FIG. 3 illustrates generation of a list of hyperlinks from a web page, such as web page 101 in the embodiment of FIG. 1 received from a web server 102.

As each link is extracted from web page 101, an examination is made in order to eliminate links which refer back to web server 102 and to determine whether redirection links are present. This is typically done by searching for the presence of a string "http://" encoded in the URL, which characterizes a redirection link. In the case of links, which appear to be redirection links, only the ultimate destination is listed. In the case of links which do not appear to be redirection links, the links themselves are listed. The resulting list is employed as an input to the functionality of FIG. 4.

In the illustrated embodiment of FIG. 3, all of the hyperlinks are processed. Alternatively, not all of the hyperlinks need be processed. In such a case, a user may decide which hyperlinks to process.

Reference is now made to FIG. 4, which is a simplified flow chart of visualization functionality employed in accordance with a preferred embodiment of the present invention. As seen in FIG. 4, a list of hyperlinks is received. This list



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may be derived from a web page such as web page 101 in the embodiment of FIG. 1 using the functionality of FIG. 3 or may be provided by dynamic page generator 204 and obtained via database 208 in the embodiment of FIG. 2.

If hyperlinks are present, the URL of each hyperlink is split into URL components. For example, if the URL of a hyperlink appears as follows:

`http://www.microsoft.com:80/windows2000/upgrade/compat/search/computers.asp?page=2&send=1&Order=Sort+by+Company&CN=Dell&PN=&PT=`

The components thereof include the following:

Scheme: http

Host: www.microsoft.com

Port: 80

Path: /windows2000/upgrade/compat/search/computers.asp

Query: page=2&send=1&Order=Sort+by+Company&CN=Dell&PN=&PT=

The path component may be trimmed based on the consideration of finding the most representative image of a given web page. A flow chart illustrating a preferred algorithm for making this determination appears in FIG. 5 and is described hereinbelow.

Thus, in the above example, the trimmed path component appears as follows:

`/windows2000/upgrade`

Following any trimming of the path component, a new URL is constructed from the scheme, host, port and trimmed path components. This URL is employed for outputting an http query to an image server, such as image server 104 in the embodiment of FIG. 1 or 210 in the embodiment of FIG. 2.

A preferred form of http query in the above example appears as follows:

`http://wb1.girafa.com/srv/i?`

`u=http://`

`www.microsoft.com%2fwindows2000%2fupgrade`

Reference is now made to FIG. 5, which is a simplified flow chart of path component trimming functionality employed in the embodiment of FIG. 4. As seen in FIG. 5, the path component trimming functionality comprises receipt of the URL components after splitting thereof, as described hereinabove with reference to the flowchart of FIG. 4. Information from the host component of the URL is employed in trimming of the path component of the URL. Each path component comprises a plurality of path segments.

If the last path segment in a path component is a file name, this path segment is removed. Determination whether a path component is a file name is typically carried out by examining the suffix thereof to determine whether it is a known suffix representing a file name.

If the first path segment starts with a "~", which typically designates a home directory in a Unix system, the path component is trimmed after that first path segment.

If the host is not www.geocities.com, the path component is trimmed after the second path segment.

If the host is www.geocities.com and any of the first three path segments consists of 4 digits, the path component is trimmed after the first segment that consists of 4 digits.

If the host is % www.geocities.com and none of the first three path segments consists of 4 digits, the path component is trimmed after the second segment.

Reference is now made to FIG. 6, which is a simplified block diagram illustration of a system for generating an image database useful in the system and methodology of FIGS. 1 and 2. As seen in FIG. 6, a controller 600 receives a list 602 of homepages, the images of which it is desired to

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download into an image database 604, such as image database 106 in the embodiment of FIG. 1 or image database 212 in the embodiment of FIG. 2.

The controller 600 operates a multiplicity of downloaders 606 simultaneously by supplying to each downloader one URL at a time. Each downloader 606 retrieves from the Internet, the homepage and the embedded objects corresponding to the URL supplied to it by the controller 600 and deletes therefrom executable block content. The resulting output of the downloaders 606 is supplied to a web server 608 via a database 610.

Each downloader 606 establishes a connection with one of a plurality of thumbnail generators 612 via a broker 614. Once this connection has been established, a URL of a locally stored copy of a downloaded homepage, which is stored in database 610, is sent to the thumbnail generator 612 with which the connection has been established.

Each thumbnail generator 612 operates a corresponding web browser 616 to download via web server 608 the locally stored copy of the homepage, which is stored in database 610. The thumbnail generators 612 each receive a rendered image of the homepage from a corresponding web browser 616 and shrink it and supply it to the downloader 606 with which the connection has been established.

It is appreciated that normally the number of downloaders exceeds the number of thumbnail generators by at least an order of magnitude. The broker 614 coordinates interaction between a thumbnail generator and a downloader.

Reference is now made to FIG. 7, which is a flow chart illustrating operation of a controller forming part of the system of FIG. 6. A list of homepages is received from database 602 (FIG. 6). Each homepage is taken from the list and downloaded by a downloader 606 (FIG. 6). The functionality of FIG. 7 ensures that a predetermined number of downloaders operate simultaneously, so long as the list of undownloaded homepages is sufficiently long.

Reference is now made to FIG. 8, which is a flow chart illustrating operation of a downloader forming part of the system of FIG. 6. As seen in FIG. 8, each downloader maintains a download queue for the homepage which the downloader is currently downloading. The download queue includes a list of URLs of objects in the homepage as well as the homepage object that require downloading in order to provide a local copy of the homepage.

For each URL in the download queue, an inquiry is made whether a local copy of the object corresponding thereto already exists. If so, a link to that local copy is created. If not, an attempt is made to download the object. If upon attempting to download the object, the downloader is informed that the object is located on another URL, i.e. by the receipt of redirection reply, that URL is placed in the download queue.

If the download is successful, the downloaded object is stored in database 610 (FIG. 6) as a local copy. If the downloaded object is an HTML page, then the HTML page is processed, preferably by an algorithm of the type described hereinbelow in FIG. 9.

When the download queue is empty, a connection is established with thumbnail generator 612 (FIG. 6) via broker 614 (FIG. 6). The URL of the local copy of the homepage object is sent to the thumbnail generator 612 and a thumbnail image of the homepage is generated hereby. This thumbnail image is stored in image database 604 (FIG. 6).

Reference is now made to FIG. 9, which is a flow chart illustrating operation of a process HTML algorithm employed in the downloader of FIG. 8. The HTML object



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which is downloaded is scanned, the executable content thereof is eliminated and embedded objects therein are recognized.

For each embedded object a decision is made whether to download it. This decision is made based on the nature of the embedded object and the nature of the reference thereto. Generally, images and HTML objects are downloaded.

URLs of objects to be downloaded are placed in the download queue referred to hereinabove in connection with FIG. 8 and the HTML object is modified to refer to the local copies of the objects to be downloaded. References to objects not to be downloaded are eliminated from the HTML object.

Reference is now made to FIG. 10, which is a flow chart illustrating operation of a thumbnail generator, such as thumbnail generator 612, forming part of the system of FIG. 6. Initially, the thumbnail generator initializes a web browser functionality 616 (FIG. 6). When a connection is established to the thumbnail generator 612 from a downloader 606 (FIG. 6) via a broker 614 (FIG. 6), the thumbnail generator 612 receives the URL of the local copy of the homepage.

The web browser navigates to that URL and renders the homepage. A snapshot of the homepage is taken, typically in bitmap form. This snapshot is resized to a desired thumbnail size and is then transmitted via the downloader 606 for storage in image database 604.

Reference is now made to FIG. 11, which is a flow chart illustrating operation of a broker, such as broker 614, forming part of the system of FIG. 6. The broker receives connection requests from both thumbnail generators 612 (FIG. 6) and downloaders 606 (FIG. 6). When simultaneous requests are pending from both a thumbnail generator and a downloader, the broker establishes a direct connection therewith. When there exists a surplus of connection requests from either thumbnail generators 612 or downloaders 606, queues of such connection requests may be maintained by the broker.

A preferred method for constructing A Framework For Providing Visual Context To WWW Hyperlinks in accordance with a preferred embodiment of the present invention includes the following steps:

1. Generate Binary file GIRAFA.hex from the computer listing of Appendix A.
2. Decode GIRAFA.hex using a MIME compliant decoder, creating Girafa-1-45.exe.

The method for starting the visualization functionality of FIG. 1 with the program in Appendix A includes the following steps:

1. Provide a computer terminal such as an Intel-based Pentium III 800 MHz computer, configured with Microsoft Windows 98 operating system, and Internet Explorer 5.5 Web Browser.
2. Load the file Girafa-1-45.exe to a temporary directory in the computer terminal provided in step 1, Execute the file Girafa-1-45.exe, and follow the installation instructions. When asked to register, press 'cancel'.
3. Edit the file Girafa.ini in the installation directory, replacing every occurrence of the string 'aranja.girafa.com' with the hostname of the image server, and every occurrence of the number 8080 with the number 80.
4. Start the Internet Explorer browser.
5. In the Internet Explorer Window select the View Menu, in it select the Explorer Bars sub-menu, and in it choose GirafaBar.
6. Follow the registration procedure.

A further preferred method for constructing A Framework For Providing Visual Context To WWW Hyperlinks in

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accordance with a preferred embodiment of the present invention includes the following steps:

1. Generate Binary file ARANHA.hex from the computer listing of Appendix B.

2. Decode ARANHA.hex using a MIME compliant decoder, creating aranha.tgz.

The method for providing the functionality of FIG. 6 with the program in Appendix B includes the following steps:

1. Provide a computer server such as a Dell PowerEdge 2450, with at least 1 GB of main memory, configured with OpenBSD 2.7 operating system, and MySQL 3.23.25 database, and connected to the Internet.
2. Create the directory /var/www/httpd/collect.
3. Create the directory /data1.

4. In /data1 extract the file aranha.tgz by using the command 'tar xvzf aranha.tgz', creating /data1/aranja/aranja.conf, /data1/aranja/capture.zip, /data1/aranja/db.def, /data1/aranja/mod\_asis.so, /data1/aranja/bin, /data1/aranja/bin/broker, /data1/aranja/bin/controller, /data1/aranja/bin/downloader, /data1/aranja/bin/downloader.real, and a skeleton image directory /data1/aranja/images.
5. Edit the file /data1/aranja/aranja.conf, replacing the string <SERVER\_IP\_ADDRESS> with the server's IP address, the string <DBUSER> with a MySQL username that have full access to

- database named DATA, and the string <DBPASSWORD> with the password of that user.
6. Create the MySQL database, and initialize it by running the MySQL script /data1/aranja/db.def.
7. Set the environment variable ARANHA\_CONF to /data1/aranja/aranja.conf.
8. Execute, in the background, the program /data1/aranja/bin/broker.
9. Install the apache module mod\_asis.so by changing directory to /data1/aranja, and executing the command 'apxs -a -i mod\_asis.so'.
10. Set the handle\_asis as the Apache web server handler for files with suffix '.y'.
11. Start the Apache web server.
12. Provide a computer server such as a Dell PowerEdge 2450, with a display adapter capable of displaying a resolution of 1600x1280x32, such as an ATI ALL-IN-WONDER 128 32MB PCI, and an ethernet adapter such as a Netgear FA310TX, configured with Windows NT Workstation 4.0 SP4, connected via Ethernet to the computer server provided in step 1.
13. Transfer the file data1/aranja/capture.zip to the computer server provided in step 12.
14. Extract capture.zip using a WinZip 7.0 compliant decoder, to the directory c:\appl, creating c:\appl\1Source.dll, c:\appl\CapturWeb.exe, c:\appl\CaptureWeb.ini, c:\appl\Mfc42d.dll, c:\appl\Mfcn42d.dll, c:\appl\Mfco42d.dll, c:\appl\Msvcrtd.dll, c:\appl\runCaptureWeb.exe.
15. Edit the file c:\appl\CaptureWeb.ini replacing the string <SERVER\_IP\_ADDRESS> with the IP address of the OpenBSD server as provided by Step 1.
16. Execute the application c:\appl\runCaptureWeb.exe.
17. Create a list of hostnames the thumbnail of their home pages is to be created, and store in the file /tmp/list.
18. Execute the application /data1/aranja/bin/controller to download the thumbnail images of hosts listed in /tmp/list by running the command '/data1/aranja/bin/controller/tmp/list'.

Another preferred method for constructing A Framework For Providing Visual Context To WWW Hyperlinks in accordance with a preferred embodiment of the present invention includes the following steps:

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1. Generate Binary file IMAGE.hex from the computer listing of Appendix C.
2. Decode IMAGE.hex using a MIME compliant decoder, creating image\_server.tgz.

The method for providing providing the functionality of an image server of FIGS. 1 and 2 includes the following steps:

1. Provide a computer server such as a Dell PowerEdge 2450, with at least 1 GB of main memory, configured with OpenBSD 2.7 operating system. MySQL 3.23.25 database, and an image database created by the software provided in Appendix B, and Connected to the Internet.
2. Extract the binary file of Appendix C using the command 'tar xvfz image\_server.tgz', creating the directories image\_server and image\_server/errs, and the files image\_server/aranha.conf, image\_server/mod\_girafa.so, image\_server/errs/empty, and image\_servers/errs/notFL.gif
3. Change directory to image\_server
4. Install the apache module mod\_girafa.so by executing the command 'apxs -a -i mod\_girafa.so'
5. copy the file aranha.conf to /data1/aranha/aranha.conf
6. Create the directory /var/www/htdocs/errs
7. Copy the files errs/empty and errs/notFL.gif to /var/www/htdocs/errs
8. Start the apache web server.

It will be appreciated by persons skilled in the art that the present invention is not limited by what has been particularly shown and described hereinabove. Rather the scope of the present invention includes both combinations and sub-combinations of the various features described hereinabove as well as variations and modifications which would occur to persons skilled in the art upon reading the specification and which are not in the prior art.

What is claimed is:

1. A method for presenting Internet information to a user comprising:

providing to a user a visual image of a web page containing at least one hyperlink; and at least partially concurrently

providing a thumbnail visual image of the home page of at least one web site which is represented by said at least one hyperlink via the Internet by employing an image server that stores and provides said thumbnail visual image.

2. A method according to claim 1 and wherein said thumbnail visual image is displayed alongside the visual image of said web page.

3. A method according to claim 2 and wherein said thumbnail visual image appears hovering over said hyperlink.

4. A method according to claim 1 and wherein said thumbnail visual image is displayed within the visual image of said web page.

5. A method according to claim 4 and wherein said thumbnail visual image appears hovering over said hyperlink.

6. A method according to claim 1 and wherein a plurality of thumbnail visual images represented by at least one hyperlink are displayed simultaneously along with said visual image of a web page containing at least one hyperlink.

7. A method according to claim 1 and wherein said web page comprises an HTML page.

8. A method according to claim 1 and wherein said providing a thumbnail visual image comprises:

employing a web browser including visualization functionality which interfaces via the Internet with said image server.

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9. A method according to claim 8 and wherein said visualization functionality is operative to download via the image server from an image database images of web pages which represent hyperlinks contained in the web page and to provide to a user, via the web browser, an annotated web page.

10. A method according to claim 8 and wherein said visualization functionality comprises:

generation of a list of hyperlinks from a web page;

elimination of links which refer back to a web server sending said web page;

determination of whether redirection links are present and if so, providing thumbnail visual images of ultimate destinations thereof; and

providing thumbnail visual images of remaining hyperlinks.

11. A method according to claim 8 and wherein said visualization functionality comprises:

receiving a list of hyperlinks;

splitting a URL of each hyperlink into URL components including at least a path component and a host component;

trimming a path component based on the consideration of finding the most representative image of a given web page; and

constructing a new URL including a trimmed path component.

12. A method according to claim 1 and wherein said providing a thumbnail visual image comprises:

employing a web browser which interfaces via the Internet with a web server including visualization functionality.

13. A method according to claim 12 and wherein said visualization functionality is operative to embed commands to the web browser to download, via said image server, thumbnail visual images of web pages which represent hyperlinks contained in the web page and to provide to a user, via the web browser, an annotated web page.

14. A method according to claim 13 and wherein said annotated web page includes the web page having within it thumbnail visual images of homepages of web sites referenced by hyperlinks contained in the web page.

15. A method according to claim 1 and wherein said thumbnail visual image appears hovering over said hyperlink.

16. A method for generating an image server database of thumbnail visual images of web pages, the method comprising:

receiving a list of URLs corresponding to said web pages, the thumbnail visual images of which it is desired to supply to said image server database;

operating a multiplicity of downloaders simultaneously to retrieve from the Internet, web pages and embedded objects corresponding to URLs from said list;

causing a thumbnail generator to render retrieved web pages retrieved simultaneously by said multiplicity of downloaders; and

causing said thumbnail generator to shrink said rendered images of said retrieved web pages and supply them to said image server database.

17. A method according to claim 16 also comprising deleting executable content from said retrieved web pages.

18. A system for presenting Internet information to a user comprising:

first functionality providing to a user a visual image of a web page containing at least one hyperlink; and

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second functionality operative at least partially concurrently with said first functionality for providing a thumbnail visual image of the home page of at least one web site which is represented by said at least one hyperlink via the Internet by employing an image server that stores and provides said thumbnail visual image.

19. A system according to claim 18 and wherein said thumbnail visual image is displayed alongside the visual image of said web page.

20. A system according to claim 19 and wherein said thumbnail visual image appears hovering over said hyperlink.

21. A system according to claim 18 and wherein said thumbnail visual image is displayed within the visual image of said web page.

22. A system according to claim 21 and wherein said thumbnail visual image appears hovering over said hyperlink.

23. A system according to claim 18 and wherein a plurality of thumbnail visual images represented by at least one hyperlink are displayed simultaneously along with said visual image of a web page containing at least one hyperlink.

24. A system according to claim 18 and wherein said web page comprises an HTML page.

25. A system according to claim 18 and wherein said second functionality comprises third functionality employing a web browser including visualization functionality which interfaces via the Internet with said image server.

26. A system according to claim 25 and wherein said visualization functionality is operative to download via the image server from an image database images of web pages which represent hyperlinks contained in the web page and to provide to a user, via the web browser, an annotated web page.

27. A system according to claim 25 and wherein said visualization functionality comprises:

- generation of a list of hyperlinks from a web page;
- elimination of links which refer back to a web server sending said web page;
- determination of whether redirection links are present and if so, providing thumbnail visual images of ultimate destinations thereof; and
- providing thumbnail visual images of remaining hyperlinks.

28. A system according to claim 25 and wherein said visualization functionality comprises:

- receiving a list of hyperlinks;
- splitting a URL of each hyperlink into URL components including at least a path component and a host component;
- trimming a path component based on the consideration of finding the most representative image of a given web page; and
- constructing a new URL including a trimmed path component.

29. A system according to claim 18 and wherein said second functionality comprises fourth functionality employing a web browser which interfaces via the Internet with a web server including visualization functionality.

30. A system according to claim 29 and wherein said visualization functionality is operative to embed commands to the web browser to download, via said image server, thumbnail visual images of web pages which represent hyperlinks contained in the web page and to provide to a user, via the web browser, an annotated web page.

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31. A system according to claim 30 and wherein said annotated web page includes the web page having within it thumbnail visual images of homepages of web sites referenced by hyperlinks contained in the web page.

32. A system according to claim 18 and wherein said thumbnail visual image appears hovering over said hyperlink.

33. A system for generating an image server database of thumbnail visual images of web pages, the system comprising:

- a multiplicity of downloaders, each receiving at least one URL from a list of URLs corresponding to said web pages, the thumbnail visual images of which it is desired to supply to said image server database, and simultaneously retrieving from the Internet web pages and embedded objects corresponding to said at least one URL; and

at least one thumbnail generator operative to render the web pages, shrink said rendered images of the web pages and supply said rendered images to said image server database.

34. A system according to claim 33 and wherein said multiplicity of downloaders are operative to delete executable content from the web pages.

35. A method for presenting Internet information to a user comprising:

- providing to a user a visual image of a web page containing at least one hyperlink; and at least partially concurrently

providing a thumbnail visual image of another web page of at least one web site which is represented by said at least one hyperlink via the Internet by employing an image server that stores and provides said thumbnail visual image,

said providing a thumbnail visual image comprising employing a web browser which interfaces via the Internet with a web server, separated from said image server, including visualization functionality, said visualization functionality being operative to embed commands to the web browser to download, via said image server, thumbnail visual images of web pages which represent hyperlinks contained in the web page and to provide to a user, via the web browser, an annotated web page.

36. A method according to claim 35 and wherein said thumbnail visual image is displayed alongside the visual image of said web page.

37. A method according to claim 36 and wherein said thumbnail visual image appears hovering over said hyperlink.

38. A method according to claim 35 and wherein said thumbnail visual image is displayed within the visual image of said web page.

39. A method according to claim 38 and wherein said thumbnail visual image appears hovering over said hyperlink.

40. A method according to claim 35 and wherein a plurality of thumbnail visual images represented by at least one hyperlink are displayed simultaneously along with said visual image of a web page containing at least one hyperlink.

41. A method according to claim 35 and wherein said web page comprises an HTML page.

42. A method according to claim 35 and wherein said annotated web page includes the web page having within it thumbnail visual images of homepages of web sites referenced by hyperlinks contained in the web page.

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43. A method according to claim 35 and wherein said visualization functionality comprises:

generation of a list of hyperlinks from a web page;  
elimination of links which refer back to a web server  
sending said web page;  
determination of whether redirection links are present and  
if so, providing thumbnail visual images of ultimate  
destinations thereof; and  
providing thumbnail visual images of remaining hyper-  
links.

44. A method according to claim 35 and wherein said visualization functionality comprises:

receiving a list of hyperlinks;  
splitting a URL of each hyperlink into URL components  
including at least a path component and a host com-  
ponent;  
trimming a path component based on the consideration of  
finding the most representative image of a given web  
page; and  
constructing a new URL including a trimmed path com-  
ponent.

45. A method according to claim 35 and wherein said thumbnail visual image appears hovering over said hyper-  
link.

46. A system for presenting Internet information to a user comprising:

first functionality providing to a user a visual image of a  
web page containing at least one hyperlink; and  
second functionality operative at least partially concu-  
rently with said first functionality for providing a  
thumbnail visual image of another web page of at least  
one web site which is represented by said at least one  
hyperlink via the Internet by employing an image  
server that stores and provides said thumbnail visual  
image, said second functionality comprising third func-  
tionality employing a web browser which interfaces via  
the Internet with a web server, separated from said  
image server, including visualization functionality,  
said visualization functionality being operative to embed  
commands to the web browser to download, via said  
image server, thumbnail visual images of web pages  
which represent hyperlinks contained in the web page  
and to provide to a user, via the web browser, an  
annotated web page.

47. A system according to claim 46 and wherein said thumbnail visual image is displayed alongside the visual  
image of said web page.

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48. A system according to claim 47 and wherein said thumbnail visual image appears hovering over said hyper-  
link.

49. A system according to claim 46 and wherein said thumbnail visual image is displayed within the visual image  
of said web page.

50. A system according to claim 49 and wherein said thumbnail visual image appears hovering over said hyper-  
link.

51. A system according to claim 46 and wherein a plurality of thumbnail visual images represented by at least  
one hyperlink are displayed simultaneously along with said visual image of a web page containing at least one hyperlink.

52. A system according to claim 46 and wherein said web page comprises an HTML page.

53. A system according to claim 46 and wherein said annotated web page includes the web page having within it  
thumbnail visual images of homepages of web sites referenced by hyperlinks contained in the web page.

54. A system according to claim 46 and wherein said visualization functionality comprises:

generation of a list of hyperlinks from a web page;  
elimination of links which refer back to a web server  
sending said web page;  
determination of whether redirection links are present and  
if so, providing thumbnail visual images of ultimate  
destinations thereof; and  
providing thumbnail visual images of remaining hyper-  
links.

55. A system according to claim 46 and wherein said visualization functionality comprises:

receiving a list of hyperlinks;  
splitting a URL of each hyperlink into URL components  
including at least a path component and a host com-  
ponent;  
trimming a path component based on the consideration of  
finding the most representative image of a given web  
page; and  
constructing a new URL including a trimmed path com-  
ponent.

56. A system according to claim 46 and wherein said thumbnail visual image appears hovering over said hyper-  
link.

\* \* \* \* \*

# **EXHIBIT 2**



## Ran Exhibit 2

Browser Extras & Add-Ons - Girafa 2.08 - Reviews by PC Magazine - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print

Address http://www.pcmag.com/article2/0,2704,15447,00.asp Go Links

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Comparisons

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- Browser Extras & Add-Ons
  - Browser Extras & Add-Ons
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  - Girafa 2.08
    - AddaButton 1.6
    - Microsoft I.E. 5.0 Toolbar Wallpaper
    - AI RoboForm 4.3.7
    - Clickgarden Professional 1.3
    - NetCaptor 7.0
    - iAnnotate-it 2.0
    - Web Highlighter

**Girafa 2.08**

REVIEW DATE: 06.11.02

- Product: Girafa 2.08
- Price: Free download
- Company Info: Girafa.com Inc., [www.girafa.com](http://www.girafa.com)

Editor's Rating: ●●●●○

Buy It Here: [Check Prices](#)

By Alan Cohen

Girafa 2.08, a slick IE add-on, can save you time—and frustration—in your Web travels by giving you visual previews of sites. Highlight a link on any Web page, then press the Visualize button in the collapsible Girafa pane. Immediately, a thumbnail of the site appears in the window. You need fighter-pilot vision to make out details in the thumbnail (alas, you can't enlarge it), but you'll usually get a good idea of whether you'd like to visit the site.

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# **EXHIBIT 3**

## Ran Exhibit 3

Free Software Downloads and Software Reviews - Download.com - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address <http://www.download.com/1200-2645-976280.html?tag=sptit> Go

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### Soup up that browser

(12/6/02)

Power Downloader customizes everything he owns. He fitted the Power Mobile, a 1976 AMC Pacer, with Mini Desert Trak tires and shock mounted KC HiLites, making it suitable for the Paris to Dakar rally. His microwave oven sports an experimental amplifier, so his macaroni and cheese is ready to eat in only 20 seconds. And, of course, this monomania for performance add-ons extends to his software as well. Most notably, Power keeps an array of browser enhancements installed so he can whip around Web sites faster than anyone. Now he just needs to get some wealthy sponsors interested in promoting the first World Wide Web rally.

### Get a sneak preview

Although he'll never admit it, Power has commitment issues. When approaching a new Web site, he's often loath to put in the time to learn the navigation and find the good stuff. In fact, Power was about to give up on Web exploration all together when he found Girafa. The utility works in concert with Power's browser and lets him stay free and easy by offering a simple sneak peek into any Web site. Just enter any search term into the utility and you get a combo of traditional search results as well as thumbnail snapshots of the top results. It's a great timesaver, since Power can weed out irrelevant or redundant sites with a quick glance rather than a prolonged visit. If he likes what he sees, he just double-clicks on the thumbnail, and the site is loaded up. Search results and thumbnails of Power's favorite sites can also be saved so he can have a quick look whenever he wants.



Girafa displays search results as thumbnail images of the actual sites.



# **EXHIBIT 4**

## Ran Exhibit 4

Three downloads that maximize your Web browser's power - Microsoft Internet Explorer

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Address [http://review.zdnet.com/4520-6033\\_16-4205819.html](http://review.zdnet.com/4520-6033_16-4205819.html) Go

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**Three downloads that maximize your Web browser's power**

**TALK BACK!** Add your opinion

Preston Gralla  
Contributor, AnchorDesk  
Monday, April 16, 2001

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Format for [PRINTER](#)

Is it just me, or is the thrill gone when it comes to Web browsers? Can you remember the last time you actually looked forward to a browser upgrade instead of facing it with fear and loathing?

Me too. So I went into trusty [ZDNet Downloads](#) and found three great browser companions that'll put the thrill back into Web browsing. One more reason they're thrilling: They're all free.

[Atomica One-Click for Windows](#) is a great way to gather gobs of information from whatever Web site you're on. Hold down the Alt key and click a word, and the program analyzes the word in context using its Web-based dictionary, thesaurus, encyclopedia, and translation tools. It offers related links as well. ([Shareware/Win95-98-NT](#))

[Girafa](#) takes the legwork out of searching the Internet—it shows you thumbnails of search results whenever you use a search engine, then lets you hop over to the site with a click. ([Shareware/Win95-98-NT](#))

[Alexa for Internet Explorer](#) shows you sites related to any Web page you visit and also gives you background information on the sites you visit, including traffic numbers, ratings, and reviews from other Alexa members. Other details include contact information, number of links in a page, and the number of pages that make up the site. ([Shareware/Win95-98-NT](#))

With these browser companions, who cares when the next upgrade to Internet Explorer or Netscape comes along? Those bloated browser-beasts will never match the features in these great programs anyway.

*What do you use to spiff up your browser? TalkBack to me.*

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# **EXHIBIT 5**

**From:** Shirli Ran [shirli@girafa.com]  
**Sent:** Tuesday, April 13, 2004 8:40 AM  
**To:** Aboyer@Idealab. Com  
**Subject:** RE: pricing information request

Hi Aaron,

Following our phone conversation, attached please find pricing information for the use of 100K, 500K and 2M images per month, using a homepage mode service, as discussed.

If you prefer to use inner page mode, you will have to decide how many unique URLs will be used in that mode. Using up to 2 million inner page URLs will increase the monthly price by \$6,090. Using up to 5 million inner page URLs will increase the monthly price by \$15,080.

As discussed during our phone conversation, the service fees for Girafa's default service (homepage mode) are significantly lower.  
Please let me know if you have any questions.

I look forward to hearing from you.

Thanks,  
Shirli

-----  
Shirli Ran  
COO  
Girafa.com, Inc.  
Office +972-3-7515530 ext.107  
Cell +972-53-604061

Search and See!  
<http://www.girafa.com>

-----Original Message-----

From: Aaron Boyer  
Sent: Wednesday, April 07, 2004 8:30 PM  
To: shirli@girafa.com  
Subject: RE: pricing information request

Hello Shirli,

Would tomorrow, Thursday, at 11am PST (12pm your time, by the look of the time signature on your email) work for you? My number is (626) 685-4965.

Aaron Boyer  
Research and Development  
idealab!

-----Original Message-----

From: Shirli Ran  
Sent: Wednesday, April 07, 2004 6:48 AM  
To: aboyer@idealab.com  
Subject: RE: pricing information request

Hi Aaron,

Thank you for your interest in Girafa. Based on our core technology, we offer a range of visualization solutions to suite the specific needs of the markets we serve, from small to medium directory sites, to mega portals and search engines.

Girafa's Visualization services are available for a monthly usage fee, based on the size of your database, volume of searches and any customization needs that you may have. In order to determine the type of service required for your site, I would like to better understand your service needs. Are you available for a quick call this morning, or tomorrow morning?

Thanks,  
Shirli

-----  
Shirli Ran  
Girafa.com  
Office 011-972-3-7515530 ext.107

Search and See!  
<http://www.girafa.com>

-----Original Message-----

From: Aaron Boyer  
Sent: Friday, April 02, 2004 9:17 PM  
To: sales@girafa.com  
Subject: pricing information request

Dear Girafa Representative,

We are interested in integrating thumbnails into a web search product we're developing, and would like pricing information based on 270 million possible unique web pages, at 100k, 500k, and two million thumbnails per month. If you are able to deliver thumbnails at 200x150 pixels, we would also like pricing information for that size, in the aforementioned volumes.

Sincerely,

Aaron Boyer  
Research and Development  
idealab!

# **EXHIBIT 6**

## Ran Exhibit 6

---

**From:** Jay Meattle [mailto:jmeattle@compete.com]  
**Sent:** Wednesday, August 08, 2007 5:18 PM  
**To:** shirli@girafa.com  
**Subject:** RE: Girafa - Compete / use of thumbnails

Hi Shirli,

Thanks for reaching out. We already have a relationship in place with Snap. If that changes, I'll contact you.

Best,  
Jay

---